

CWU Table Item #: 0150 (1 column)

TABLE 2

Comparison of properties of various materials for use as flexible MEMS members				
Material	Alloy 851	Silicon	Be-Cu	Gold
Fracture toughness	Excellent	Poor	Excellent	Excellent
Toxicity	Low	Low	Very high	Low
Corrosion resistance	Excellent	Excellent	Poor	Excellent
Yield strength	Excellent	Excellent	Good	Very poor
Electrical conductivity	Good	Poor	Excellent	Excellent
Plasticity	Low	Low	Moderate	High

+T1 TABLE 2+HZ, 1/32

!+HC, 1 Comparison of properties of various materials?

!for use as flexible MEMS members+HZ, 1/32 ?

!+TL, 1 Material? +TL, 8 Alloy 851? +TL, 14 Silicon? +TL, 20 Be+13 Cu? +TL, 26 Gold?

!Fracture? Excellent? Poor? Excellent? Excellent?

!toughness?

!Toxicity? Low? Low? Very high? Low?

!Corrosion? Excellent? Excellent? Poor? Excellent?

!resistance?

!Yield strength? Excellent? Excellent? Good? Very poor?

!Electrical? Good? Poor? Excellent? Excellent?

!conductivity?

!Plasticity? Low? Low? Moderate? High+TZ, 1/32 ?

!+PS

Item character count = 426

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TABLE 3

Measured properties of various materials used as flexible MEMS members*				
Material	Alloy 851	Silicon	Be-Cu	Gold
Yield Strength (GPa)	1.5	5.1	0.697	<0.01
Young's Modulus (GPa)	205	170	128	77.2
Resistivity (micro-ohm-cm)	31	150	9.6	2.2

*Data from www.Matweb.com

+T1 TABLE 3+HZ, 1/32

!+HC, 1 Measured properties of various materials?

!used as flexible MEMS members*+HZ, 1/32 ?

!+TL, 3 Material? +TC, 12 Alloy 851? +TC, 17 Silicon? +TC, 23 Be+13 Cu? +TC, 27 Gold?

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!Yield Strength? +TA 1.5? +TA 5.1? +TA 0.697? +TA +21 0.01?

!(GPa)?

!Young+3 s? 205? 170? 128? 77.2?

!Modulus (GPa)?

!Resistivity? 31? 150? 9.6? 2.2?

!(micro-ohm-cm)+TZ,1/32 ?

!+L6 *Data from www.Matweb.com

!+PS

Item character count = 291

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CWU Table Item #: 0120 (1 column)

TABLE I

Material properties of platinum alloys.					
Alloy composition	Tensile strength (MPa)	Electrical resistivity ($\mu\Omega$ -cm)	Alloy composition	Tensile strength (MPa)	Electrical resistivity ($\mu\Omega$ -cm)
Pt	163	10.6	Pt-5 wt % Rh	205	17.5
Alloy 851	2070	30.8	Pt-10 wt % Rh	310	19.2
Pt-5 wt % Ir	275	19.0	Pt-20 wt % Rh	485	20.8
Pt-10 wt % Ir	380	25.0	Pt-30 wt % Rh	540	19.4
Pt-15 wt % Ir	515	28.5	Pt-40 wt % Rh	565	17.5
Pt-20 wt % Ir	690	31.0	Pt-5 wt % Ni	640	23.6
Pt-25 wt % Ir	860	33.0	Pt-10 wt % Ni	815	29.8
Pt-30 wt % Ir	1105	35.0	Pt-20 wt % Ni	910	35.0
Pt-5 wt % Ru	415	-30	Pt-20 wt % Pd	-330-360	-25-28
Pt-10 wt % Ru	570	-47	Pt-40 wt % Pd	-370-390	-30
Pt-3.5% wt Rh	170	16.6	Pt-60 wt % Pd	-330-360	-27-29

+T1 TABLE 1+HZ,1/32

!+HC,1 +UZ,8/25 Material properties of platinum alloys.?

!+HL,1 Alloy? +HC,6 Tensile? +HC,10 Electrical? +HL,15 ? +HC,22 Tensile? +HC,27 Electrical?

!compo-? strength? resistivity? Alloy? strength? resistivity?

!sition? (MPa)? (+82 +106 -cm)? composition? (MPa)? (+82 +106 -cm)+HZ,1/32 ?

!+TL,1 Pt? +TA,6 163? +TA,10 10.6? +TL,15 Pt-5 wt % Rh? +TC,22 205? +TC,27 17.5?

!Alloy 851? 2070? 30.8? Pt-10 wt % Rh? 310? 19.2?

!Pt-5? 275? 19.0? Pt-20 wt % Rh? 485? 20.8?

!wt % Ir?

!Pt-10? 380? 25.0? Pt-30 wt % Rh? 540? 19.4?

!wt % Ir?

!Pt-15? 515? 28.5? Pt-40 wt % Rh? 565? 17.5?

!wt % Ir?

!Pt-20? 690? 31.0? Pt-5 wt % Ni? 640? 23.6?

!wt % Ir?

!Pt-25? 860? 33.0? Pt-10 wt % Ni? 815? 29.8?

!wt % Ir?

!Pt-30? 1105? 35.0? Pt-20 wt % Ni? 910? 35.0?

!wt % Ir?

!Pt-5? 415? +18 30? Pt-20 wt % Pd? +18 330+14 360? +18 25+14 28?

!wt % Ru?

!Pt-10? 570? +18 47? Pt-40 wt % Pd? +18 370+14 390? +18 30+12 ?

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!wt & Ru?

!Pt-3.5%? 170? 16.6? Pt-60 wt & Pd? +18 330+14 360? +18 27+14 29?

!wt Rh+TZ, 1/32 ?

!+PS

Item character count = 744

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